Environmental Law & Policy Center
Protecting the Midwest's Environment and Natural Heritage

# *Numeric Standards are needed to Reduce Phosphorus and Nitrogen Pollution in Illinois and downstream waters*
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**Albert Ettinger**
**aettinger@elpc.org**
**Ettinger.Albert@gmail.com**

# Nitrogen (N) and Phosphorus (P) Pollution

## Leads to:

- algae and bacteria overgrowth
- "dead zones"
- fish kills
- beach closures
- toxic algae and cyano-bacteria
- loss of recreational and property value
- human health risks / drinking water contamination from cyano bacteria and drinking water by-products

# Effects of Nitrogen and Phosphorus pollution can vary

- Scientists have known since 19th Century that phosphorus affects Lakes and Reservoirs
- Effect of phosphorus in freshwater rivers and streams is also clear but relationship between phosphorus levels and algal and bacteria growth is more complex due to flow, sunlight and other factors
- It was thought that nitrogen was not a problem in freshwater systems because phosphorus was always the "most limiting nutrient," but that is not always the case. It is very clear N causes "dead zones" in marine waters.
- Illinois needs numeric P and N standards for lakes, rivers and streams although it may be difficult to base such standards solely on data from Illinois. Illinois adopted a 0.05 mg/L standard for many lake decades ago.
- Federal law explicitly requires state standards to consider downstream water bodies. 40 CFR 131.10(b)

# Sources of phosphorus pollution

Generally was thought that major sources of P pollution were livestock, phosphorus attached to soil that ran off field, sewage treatment plants and urban run off.

Point sources are a major source of phosphorus in Illinois. David, M.B and Gentry L.E., *Anthropogenic Inputs of Nitrogen and Phosphorus and Riverine Export for Illinois, USA*, J. Environ. Qual. 29:494-508(2000)

It was thought that agricultural P entered water generally attached to soil particles. P may be also coming out through tile drains in substantial quantities in the form of dissolved reactive phosphorus. (DRP) This is discussed in the recent Ohio EPA Lake Erie Phosphorus Task Report Force (April 2010)

# History of USEPA action and inaction

- U. S. EPA has long known that N and P pollution is a problem. Phosphorus limited in detergent in 1960s
- In mid-70s, limits were agreed on with Canada regarding point sources discharging to the Great Lakes system
- Since mid-80s point source discharges to Great Lakes have generally been required to meet at least a 1.0 mg/L P limit.
- 1 mg/L limit requires much P removal (most POTW discharges over 3 mg/L without removal) but does not come close to meeting expected standards (probably less than 0.1 mg/L for most waters) unless there is available dilution. Proper standards for Midwest are probably in the range proposed by Wisconsin. (.007 Lake Michigan, .07 streams, 0.1 Rivers)

# Numeric and narrative standards

•States have narrative and numeric water quality standards. Numerics are numeric (e.g. “shall have no more than .05 mg/L TP”) Narratives (e.g. “shall be free from unnatural algal growth”) are hard to use to write permit limits and TMDLs.

•IEPA has stated that implementing narrative standards in NPDES permits is very hard and generally does not do so. The law is clear that IEPA should be using the narrative standard in writing permits. IEPA v. IPCB (New Lenox decision)

•IEPA uses a stream percentage figure for making TMDL listings of waters as affected by P but its figure (.610 mg/L) is not scientifically defensible and is almost certainly too high.

## Regulatory and citizen group moves to control N and P pollution.

- After discovery of Gulf of Mexico “Dead zone” and much work in 80s and 90s, USEPA in 1999 Clean Water Action Plan found states need numeric N and P standards.
- EPA has been very slow to force states to adopt numeric standards.
- Secondary Treatment petition was filed in November 2007 by NRDC and other organizations to require N and P removal by publicly owned treatment works (POTWs). It request technology based limits of 1.0 mg/L P and 8.0 mg/L total N or lower.
- 60 day notice of intent to sue and then lawsuit were filed in 2008 to require EPA to write numeric N and P criteria for Florida waters under Clean Water Act Section 303(c), 33 USC 1313(c). EPA later agreed to write such standards for Florida.

# Action by environmental groups on the Mississippi

• A petition was filed by a large number of groups working on Mississippi and Gulf of Mexico pollution in July 2008 for EPA to require numeric standards for the whole country or at least for tributaries to the Mississippi River because of Gulf Dead Zone and pollution of Mississippi Tributaries (e.g. Lake Pepin)

•After Florida suit reached settlement, Wisconsin groups and certain downstream groups filed 60 day notice letter in October 2009 regarding lack of numeric Wisconsin P and N standards.

•Wisconsin already in October 2009 was well on the way to developing P criteria for lakes, rivers and streams.

•Wisconsin P standards have recently been adopted

# Wisconsin's New Phosphorus Standards

- Sets water quality standards for phosphorus
  - < 10 µg/L for Great Lakes
  - 15 to 40 µg/L for other lakes and reservoirs
  - 75 to 100 µg/L for rivers and streams

- Creates option for an "adaptive management plan" to control point and nonpoint source pollution in the watershed.

- Potential to "link" with revisions to new agricultural performance standards at NR 151.

# Wisconsin stormwater rules go beyond those of most states

- Wisconsin also has an extensive program for control of run-off, including nonpoint pollution from row crop agriculture (NR 151 rules)
- Wisconsin program does generally require cost-share money from state or elsewhere before agricultural operations can be forced to put in Best Management Practices, but still this is better than most states
- Wisconsin point sources (e.g. Milwaukee Sanitary District) intend to establish programs to control nonpoint pollution in their watersheds.

# Work and Options for Illinois

More information is needed on sources of N and P and control of these pollutants

Numeric standards are needed for P and N but they do not all have to be worked out at once.

Permits and TMDLs must be written that implement numeric standards. IEPA should propose numeric nutrient standards soon or USEPA should write them.

Citizen groups could take their own proposal to the Pollution Control Board.

Wisconsin P standards should be used in Illinois if Illinois waters are now too polluted to allow Illinois waters to be used for setting standard.

In any event, work is needed to create new laws and programs to control P pollution from all significant sources

# The road ahead

Adoption of P standards along lines adopted by Wisconsin is scientifically justifiable. Standards are supposed to protect healthy water bodies and the fact that many Illinois waters are not healthy is not an excuse for having weak standards.

Compliance plans, variances and use attainability analyses may be appropriate in some cases to provide regulatory relief for dischargers only affecting water bodies that are now so polluted that lowering N and P discharges to the lowest level attainable will not make an immediate difference. Downstream waters, though, must also be considered and case-by-case exceptions must be reconsidered over time.

Greater efforts are needed to control nonpoint pollution. This will require new state programs that go beyond the current purely voluntary approach which is not working. A number of states, in addition to Wisconsin, have programs that may serve as models. See “Cultivating Clean Water” http://elpc.org/category/natural-places/mississippi-river-protection

Habitat in Illinois water bodies should be improved. Some of the things we could do to reduce N and P pollution, such as restoring wetlands, will also improve habitat. While trading, as in a commodity exchange, will not work for N and P, carefully regulated offsets hold promise for reducing costs.